

## Materials and Manufacturing Cheat Sheet by JekyllOfHearts via cheatography.com/186313/cs/38929/

| Component and Material Properties |  | Effects of chan              |                                 |
|-----------------------------------|--|------------------------------|---------------------------------|
|                                   |  | Change                       | Α                               |
| Chemical                          | Composition,   | Introduced                   |                                 |
|                                   | Phase Transformation, Oxidation and Corrosion  | Compos-<br>ition             | P<br>a<br>C                     |
| Physical                          | Melting Temper-<br>ature, Solidific-<br>ation Temper-<br>ature, Thermal<br>Properties,<br>Electrical Proper-<br>ties, Magnetic<br>Properties,<br>Density and |                              | T S T T till P M till C         |
| Mechanical                        | Colour  Elasticity Plasticity, Stiffness, Ductile Brittleness, Strength, Hardness & Wear, Creep Durability and Fatigue                                       |                              | P<br>S<br>B<br>S<br>H<br>C<br>a |
| Dimens-<br>ional                  | Durability Size Effects, Shape Effects and Surface Roughness   | Phase<br>Transf-<br>ormation | C<br>T<br>ti                    |
|                                   |  |                              | ti                              |

## Alloys

Alloys are a combination of chemical elements. Usually this is to create a material more suited for a specific need,

## **Phase Transformation**

Phase Transformation occur during heating and cooling, as well as when holding at high temperatures in time. Phase transformation has a huge impact on the material properties.

| Effects of changing composition |  |  |
|---------------------------------|--|--|
| Change<br>Introduced            | Affected Properties  |  |
| Composition                     | Phase Transformation, Oxidation, Corrosion, Melting Temperature, Solidification Temperature, Thermal Properties, Electrical Properties, Magnetic Properties, Density, Colour, Elasticity Plasticity, Stiffness, Ductility Brittleness, Strength, Hardness & Wear, Creep Durability and Fatigue Durability. |  |
| Phase<br>Transf-<br>ormation    | Oxidation, Corrosion, Thermal Properties, Electrical Properties, Magnetic Properties, Density, Colour, Elasticity Plasticity, Stiffness, Ductility Brittleness, Strength, Hardness & Wear, Creep Durability and Fatigue Durability.  |  |



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